CALIFORNIA DEPARTMENT OF PUBLIC HEALTH
850 Marina Bay Parkway, Richmond, CA 94804

ENVIRONMENTAL MANAGEMENT BRANCH
Marine Biotoxin Monitoring Program

Monthly Marine Biotoxin Report

December 2014

Technical Report No. 14-21

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of December, 2014. Ranges of toxin concentrations are provided for the paralytic shellfish poisoning (PSP) toxins and for domoic acid (DA). Estimates are also provided for the distribution and relative abundance of *Alexandrium*, the dinoflagellate that produces PSP toxins, and *Pseudo-nitzschia*, the diatom that produces domoic acid. Summary information is also provided for any quarantine or health advisory that was in effect during the reporting period.

Please note the following conventions for the phytoplankton and shellfish biotoxin distribution maps: (I) All estimates for phytoplankton relative abundance are qualitative, based on sampling effort and percent composition; (ii) All toxin data are for mussel samples, unless otherwise noted; (iii) All samples are assayed for PSP toxins; DA analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA); (iv) Please refer to the appropriate figure key for an explanation of the symbols used on the maps.

Southern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed at the San Clemente Pier on December 19 (Figure 1). Cell numbers were low. PSP toxins below the alert level were detected in rock scallop viscera from the Santa Barbara Channel

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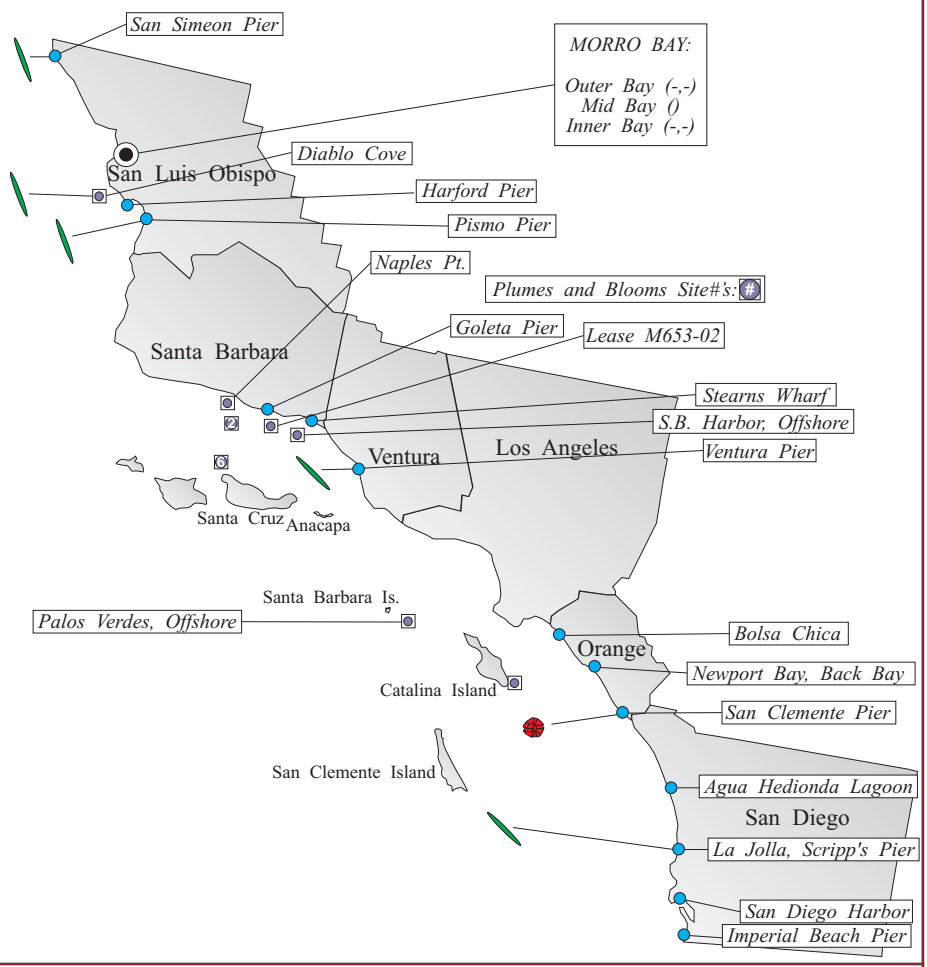
Figure 1. Distribution of toxin-producing phytoplankton in Southern California during December, 2014.



Relative Abundance of Known Toxin Producers

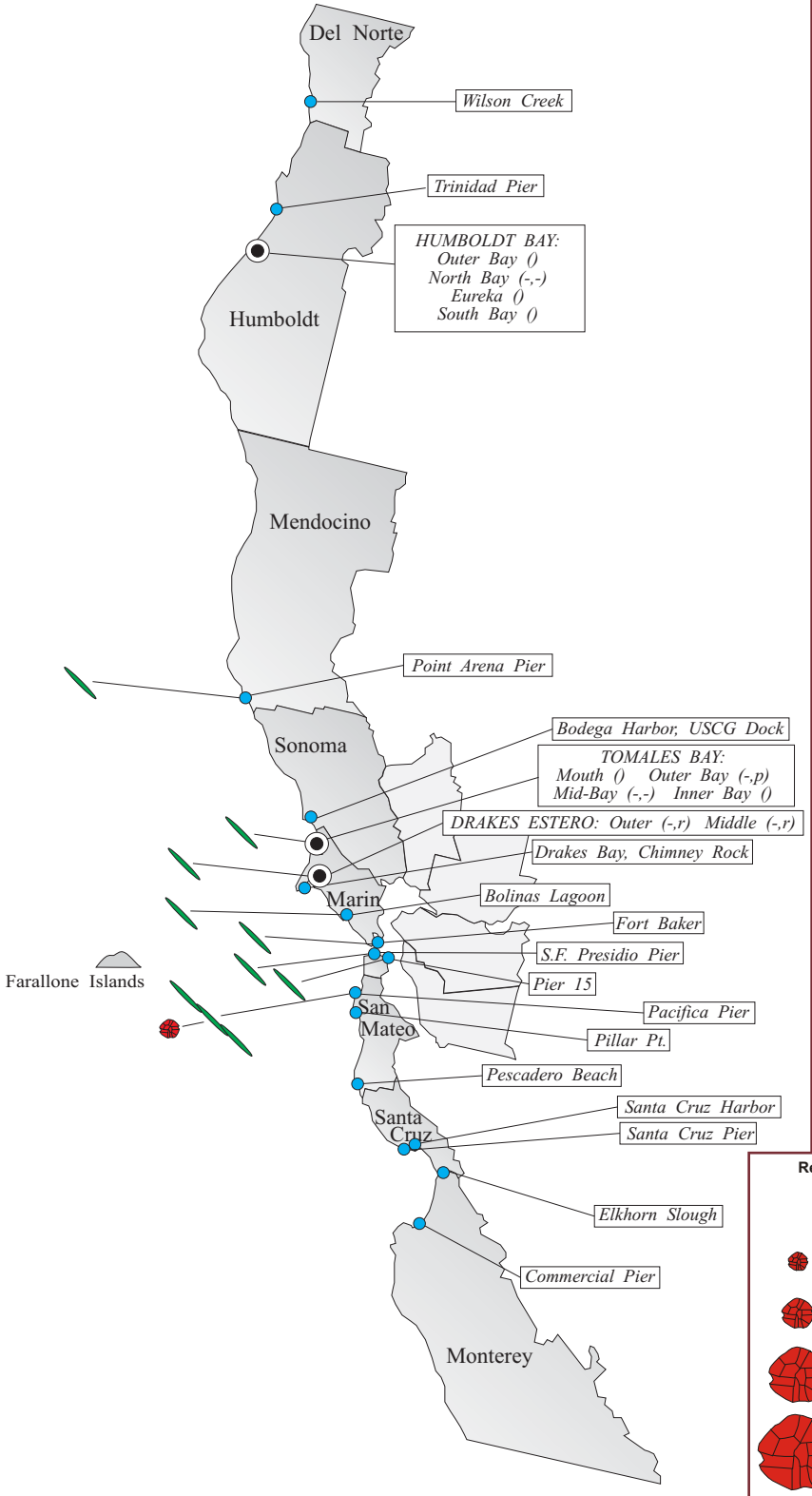
Alexandrium Species	Pseudo-nitzschia Species
Rare (less than 1%)	Present (less than 10%)
Present (between 1% and 10%)	Common (between 10% and 50%)
Common (between 10% and 50%)	Abundant (greater than 50%)
Abundant (greater than 50%)	

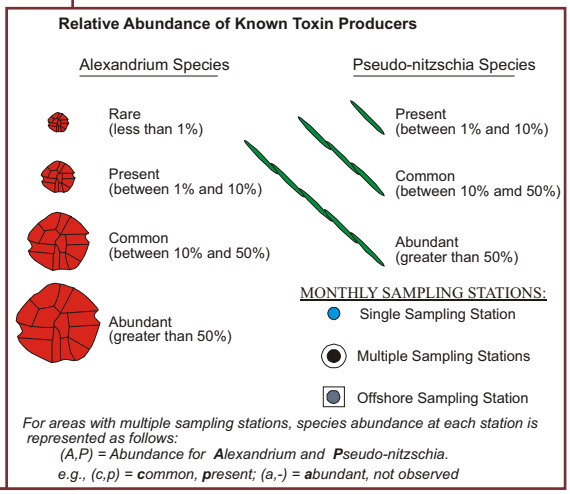
For areas with multiple sampling stations, species abundance at each station is represented as follows:
(a,p) = Abundance for Alexandrium and Pseudo-nitzschia.
e.g., (c,p) = common, present; (a,-) = abundant, not observed

MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

Figure 2. Distribution of toxin-producing phytoplankton in Northern California during December, 2014.





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during the first week of December (Figure 3).

Domoic Acid

Pseudo-nitzschia was observed at select sampling sites in San Luis Obispo, Ventura, and San Diego counties (Figure 1). The percent composition of this diatom decreased or remained low at most stations compared to November. The cell mass was low at all locations.

Domoic acid was not detected in any bivalve shellfish samples collected in December (Figure 3).

Non-Toxic Species

The diatom *Chaetoceros* was common at two of the Orange County sites. The remainder of the coast experienced low abundance of phytoplankton.

Northern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed at Pacifica Pier in San Mateo County on December 1 (Figure 2). Cell numbers were low.

Low levels of PSP toxins were detected in mussel samples collected during the first two weeks of the month at Santa Cruz Pier and during the first week of the month at Drakes Estero (Marin County). In a razor clam sample collected at Doran Beach (Sonoma

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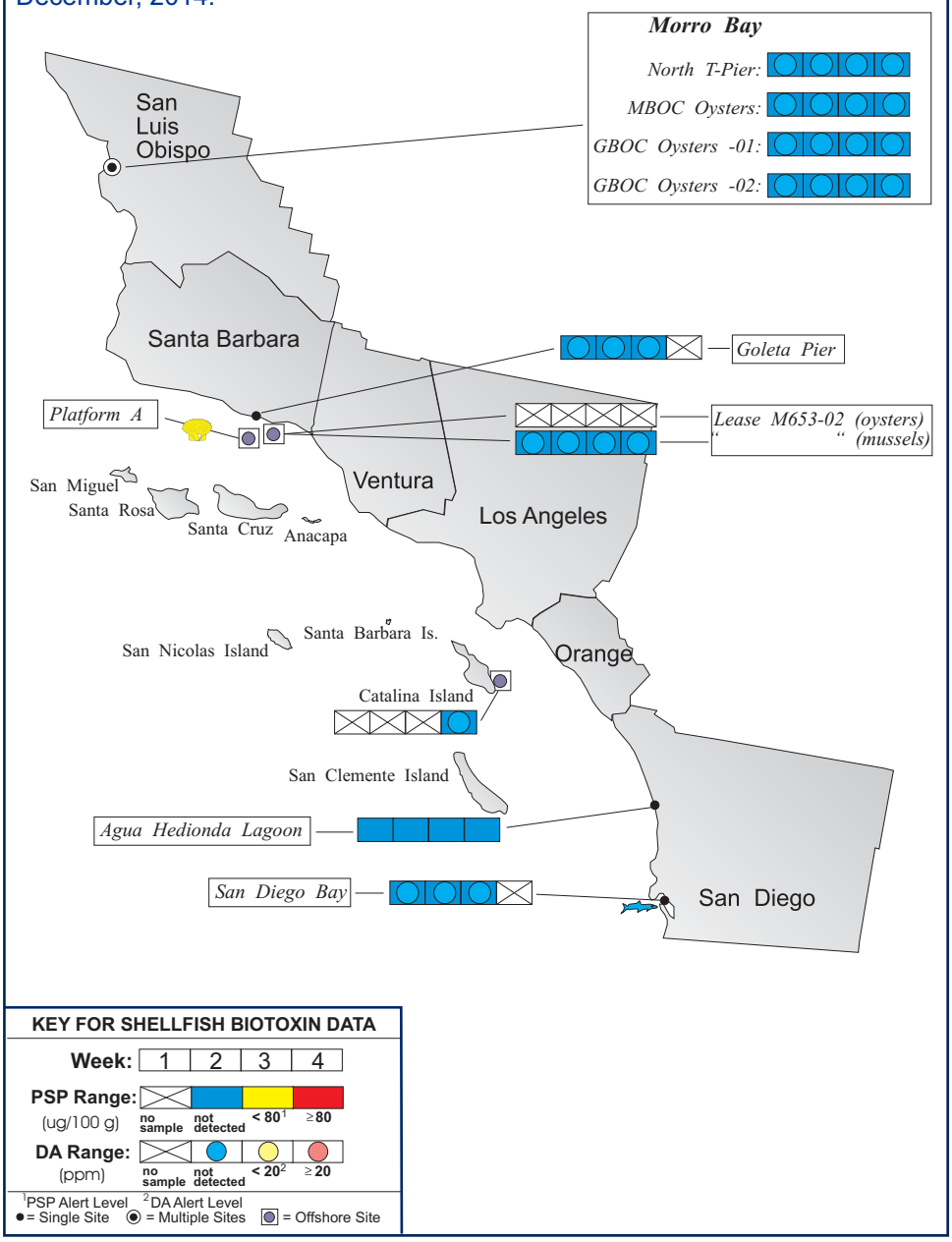
Figure 3. Distribution of shellfish biotoxins in Southern California during December, 2014.



County) on December 5, PSP toxins were detected below the alert level in the meat and above the alert level in the viscera (Figure 4).

Domoic Acid

Pseudo-nitzschia was observed at sites in Mendocino, Marin, San Francisco, and San Mateo counties, decreasing in range and abundance compared to observations in November (Figure 2). The cell mass was low at all locations.

A low level of domoic acid was detected in a razor clam viscera sample from Doran Beach (Sonoma County) (Figure 4).

Non-Toxic Species

The dinoflagellate *Ceratium furca* was common at Pier 15 (San Francisco) and Pacifica Pier (San Mateo County) during the second week of the month. All other sites had low abundances of phytoplankton.

The Marine Biotoxin Monitoring and Control Program, managed by the California Department of Public Health, is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins and domoic acid.

The Phytoplankton Monitoring Program is a state-wide effort designed to detect toxin producing species of phytoplankton in ocean water before they impact the public. The phytoplankton monitoring and observation effort can provide an advanced warning of a potential toxic bloom, allowing us to focus sampling efforts in the affected area before California's valuable shellfish resources or the public health is threatened.

For More Information Please Call:
(510) 412-4635

For Recorded Biotoxin Information Call:
(800) 553 - 4133

QUARANTINES:

The annual mussel quarantine ended at midnight on October 31 for all coastal counties except for Ventura county.

On October 10 a health advisory was issued warning consumers not to eat recreationally harvested bivalve shellfish, such as mussels, clams or whole scallops, as well as the internal organs of lobster or crab taken from Ventura county. This alert was issued due to high levels of domoic acid in samples of lobster viscera, also known as lobster "tomalley".

Consumers of Washington clams, also known as butter clams (*Saxidomus nuttalli*), are cautioned to eat only the white meat. Washington clams can concentrate the PSP toxins in the viscera and in the dark parts of the siphon and can remain toxic for a long period of time. Persons taking scallops or clams, with the exception of razor clams, are advised to remove and discard the dark parts (i.e., the digestive organs or viscera). Razor clams (*Siliqua patula*) are an exception to this general guidance due to their ability to concentrate and retain domoic acid in the edible white meat as well as in the viscera.

PSP toxins can produce a tingling around the mouth and fingertips within a few minutes to a few hours after eating toxic shellfish. These symptoms can be followed by disturbed balance, lack of muscular coordination, slurred speech and difficulty swallowing. In severe poisonings, complete muscular paralysis and death from asphyxiation can occur.

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Figure 4. Distribution of shellfish biotoxins in Northern California during December, 2014.

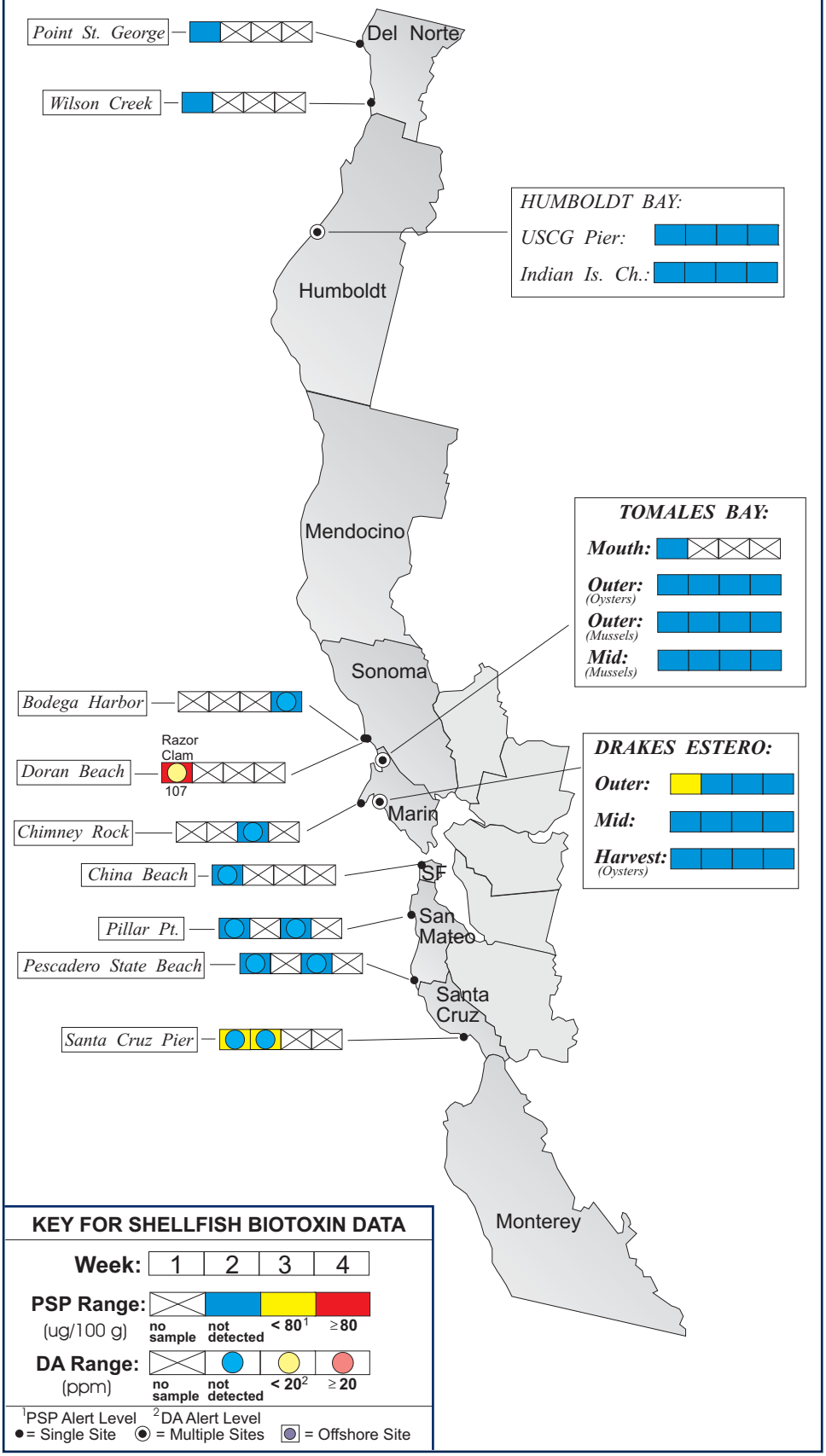

Table 1. Program participants collecting phytoplankton samples during December, 2014.

AGENCY	#	AGENCY	#
DEL NORTE COUNTY		Yurok Tribe Environmental Program	1
HUMBOLDT COUNTY			
Coast Seafood Company	5	Humboldt State University Marine Lab	3
MENDOCINO COUNTY		CDPH Volunteer (*Marie DeSantis*)	2
SONOMA COUNTY		CDPH Marine Biotoxin Program	1
MARIN COUNTY		CDPH Marine Biotoxin Program	1
Drakes Bay Oyster Company	8	CDPH Volunteer (*Anderson, Clyde*)	5
NatureBridge	1	Hog Island Oyster Company	3
SAN FRANCISCO COUNTY			
CDPH Volunteer (*Eugenia McNaughton*)	2	Exploratorium	3
SAN MATEO COUNTY			
San Mateo County Environmental Health Dept.	4	The Marine Mammal Center (*Stan Jensen*)	5
SANTA CRUZ COUNTY			
U.C. Santa Cruz	3	San Lorenzo Valley High School	2
MONTEREY COUNTY			
Monterey Abalone Company	1	Friends of the Sea Otter (*Janis Chaffin*)	2
SAN LUIS OBISPO COUNTY			
Morro Bay National Estuary Program	1	Morro Bay Oyster Company	4
Coastal Discovery Center, San Simeon	4	Tenera Environmental	2
Friends of the Sea Otter (*Cherry)*	5	CDPH Volunteer (*Vince Shay*)	2
SANTA BARBARA COUNTY			
HABNet/CDPH Volunteers (*Amiri)*	2	U.C. Santa Barbara	3
Santa Barbara Channel Keeper	4	Santa Barbara Mariculture Company	5
VENTURA COUNTY		CDPH Volunteer (*Fred Burgess*)	4
LOS ANGELES COUNTY			
Los Angeles County Sanitation District	2	CDPH Volunteers (*Cal Parsons)*	2
ORANGE COUNTY		CDPH Volunteer (*Truong Nguyen*)	2
California Department of Fish and Wildlife	3	Amigos de Bolsa Chica	4
SAN DIEGO COUNTY			
Scripps Institute of Oceanography	4	Carlsbad Aquafarms, Inc.	1
U.S. Navy Marine Mammal Program	2	Tijuana River National Estuary Research	4

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Symptoms of domoic acid poisoning can occur within 30 minutes to 24 hours after eating toxic seafood. In mild cases, symptoms of exposure to this nerve toxin may include vomiting, diarrhea, abdominal cramps, headache and dizziness. These symptoms disappear completely within several days. In severe cases, the victim may experience excessive bronchial secretions, difficulty breathing, confusion, disorientation, cardiovascular instability, seizures, permanent loss of short-term memory, coma and death.

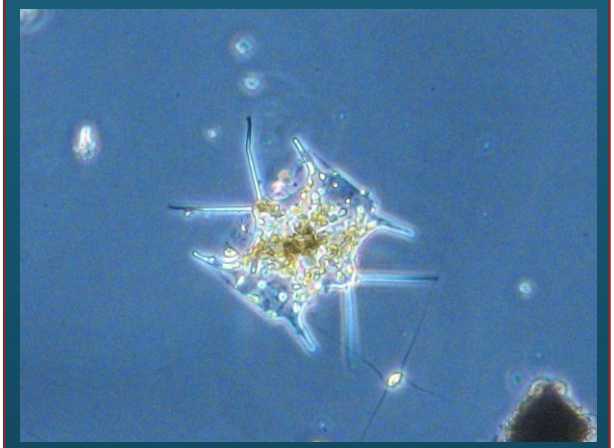
Any person experiencing any of these symptoms should seek immediate medical care. Consumers are also advised that neither cooking or freezing eliminates domoic acid or the PSP toxins from the shellfish tissue. These toxins may also accumulate in the viscera of seafood species such as crab, lobster, and small finfish like sardines and anchovies, therefore these tissues should not be consumed. Contact the "Biotoxin Information Line" at 1-800-553-4133 for a current update on marine biotoxin activity prior to gathering and consuming shellfish.

Table 2. CDPH program participants submitting shellfish samples during December, 2014.

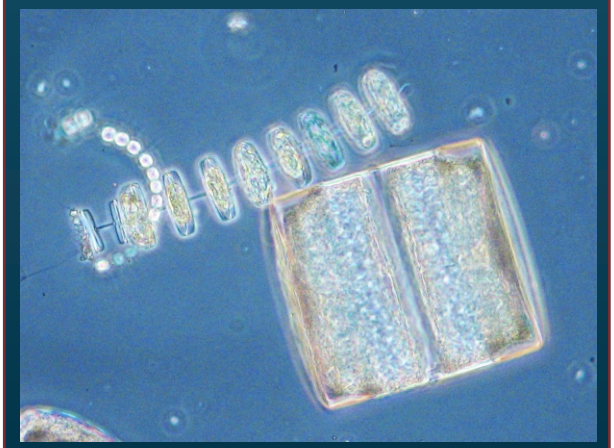
COUNTY	AGENCY	#
Del Norte	Yurok Tribe Environmental Program	2
Humboldt	Coast Seafood Company	9
Mendocino	None Submitted	
Sonoma	CDPH Marine Biotoxin Program	1
	CDPH Volunteer (*Charles Horn*)	2
Marin	Cove Mussel Company	5
	Drakes Bay Oyster Company	16
	CDPH Marine Biotoxin Program	1
	Hog Island Oyster Company	5
	Tomales Bay Oyster Company	4
	Starbird Mariculture	1
San Francisco	CDPH Volunteer (*Will Vaquilar*)	1
San Mateo	San Mateo County Environmental Health Department	4
Santa Cruz	U.C. Santa Cruz	2
Monterey	None Submitted	
San Luis Obispo	Grassy Bar Oyster Co.	12
	Morro Bay Oyster Company	8
Santa Barbara	Santa Barbara Mariculture Company	5
	U.C. Santa Barbara	5
Ventura	None Submitted	
Los Angeles	CDPH Volunteer (C*al Parsons)*	1
Orange	None Submitted	
San Diego	Carlsbad Aquafarms, Inc.	5
	U.S. Navy Marine Mammal Program	4

PHYTOPLANKTON GALLERY

The chain diatoms Stephanopyxis and Guinardia.



The diatom Odontella, cells can occur in chains or solitary.



The chain centric diatom Thalassiosira and a transverse view of the singular centric diatom Coscinodiscus.